DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Investigating the characteristics of the manganese phase of certain manganese-base alloys. Trudy Inst.met. no.5:85-94 '60. (MIRA 13:6)

(Manganese alloys--Metallography)

89632

S/509/60/000/004/004/024
E021/E106

18.1245

AUTHORS: Drits, M.Ye., Mal'tsev, M.V., Sviderskaya, Z.A., and Padezhnova, Ye.M.

TITLE: Alloys of Magnesium Containing Thorium

PERIODICAL: Akademiya nauk SSSR. Institut metallurgii. Trudy, No.4, 1960. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya, pp. 74-83

TEXT: Several binary and ternary magnesium-thorium alloys have been investigated using additions of manganese, cerium, aluminium, zinc, calcium and zirconium. The properties of magnesium-thorium alloys and also the effects of the additions on the properties at both room and elevated temperature were examined. The alloys were cast in a 20 mm diameter metallic mould heated to 50-60 °C. The main method of investigating the properties consisted of short-time (30 sec) and long-time (60 min) hardness measurements. The hardnesses were measured at room temperature and 300 °C using a 10 mm ball and a 100 kg load. The alloys were stabilised at 300 °C for 100 hours before testing. Measurements were also made after quenching from 565 °C. A marked increase

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89632

S/509/60/000/004/004/024
E021/E106

Alloys of Magnesium Containing Thorium

occurred in the hardness of magnesium in the cast and stabilised conditions with increase in thorium content to 4%. Further increases in thorium content to 6-10% had not much effect. The hardness decreased somewhat after the stabilisation treatment. After quenching the alloys from 565 °C, the hardness increased with increasing thorium content up to 10%. The prolonged hardness gave extremely high values. From microstructural and thermal analysis it was shown that the magnesium-thorium system is of the eutectic type. The eutectic consists of α-solid solution and the compound Mg_5Th, melting at 40-42% thorium and 580 °C, (Fig.2). The solubility of thorium at the eutectic temperature is 5% and at 300 °C, 0.5%. Microhardness measurements showed that the hardness of the compound was 306 kg/mm^2, the eutectic was 118 kg/mm^2, and the solid solution was 74 kg/mm^2, corresponding to a hardness for magnesium of 47 kg/mm^2. The effect of the additions of the various elements was studied using an alloy containing 3% thorium. Cerium had the greatest effect on the properties at room temperature, the hardness continuously increasing up to 6% cerium.

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Alloys of Magnesium..... S/509/60/000/004/004/024
E021/E106

Calcium and zinc had a positive effect up to 0.5-1%, further additions showing no change. Low additions of manganese and aluminium gave a decrease in hardness. Further additions gave an increase. The greatest effect on the prolonged hardness at 300 °C was shown by 0.6-1% manganese. Cerium also showed an increase, but to a lesser degree.
There are 5 figures, 6 tables and 3 English references.

Fig.2

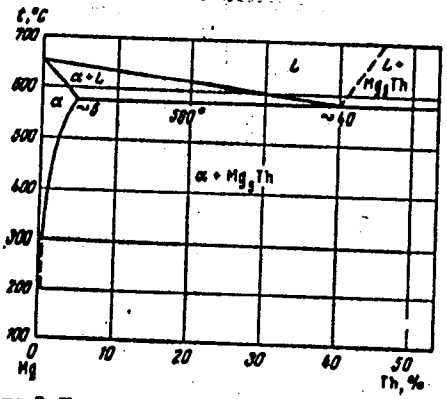

Рис. 2. Диаграмма состояния сплавов Mg — Th

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B1

PHASE I BOOK EXPLOITATION SOV/5869

Drits, Mikhail Yefimovich, Zoya Andreyevna Sviderskaya, and Esfir' Solomonovna Kadaner

Avtoradiografiya v metallovedenii (Autoradiography in Metal Science) Moscow, Metallurgizdat, 1961. 170 p. 3700 copies printed.

Ed.: L.M. Mirskiy; Ed. of Publishing House: Ye.I. Levit; Tech. Ed.: A.I. Karasev.

PURPOSE: This book is intended for technical personnel of metallurgical and metalworking plants and scientific research institutes. It may also be used by students at special schools of higher education.

COVERAGE: The book describes the autoradiographical method for the investigation of certain problems in metal science. A brief discussion of the physical fundamentals of autoradiography is presented. Particular attention is given to the

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application of this method for studying the processes of crystallization, modification, and the distribution of alloying elements and impurities in alloys. Problems connected with the use of this method for studying the redistribution of alloying elements in alloys taking place under the effect of deformation and heat treatment are discussed. Also included are data on the relationship between the distribution of alloying elements and the strength characteristics of alloys at room or elevated temperatures. No personalities are mentioned. There are 159 references, mostly Soviet.

TABLE OF CONTENTS:

28878
S/180/61/000/004/016/020
E201/E580

18.1245

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A., Kadaner, E.S. and Sinel'nikova, A.A. (Moscow)

TITLE: Recrystallisation and softening at elevated temperatures of magnesium alloys containing manganese, aluminium and calcium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1961, No.4, pp.103-110

TEXT: An attempt is made to compare the effects of Mn, Al and Ca on the recrystallisation of magnesium with the effects of the same elements on the high-temperature strength. 10 mm thick blocks, cast in a metal mould, were hot rolled at 430°C to a thickness of 2.5 mm. The sheet obtained was annealed at 350-450°C to a grain size of about 20 μ, and cold rolled to a thickness of about 1 mm. The cold-worked layer was removed by treatment with an aqueous nitric acid solution. Recrystallisation was investigated by microscopic analysis (the appearance of new grains), hardness measurements (a point of inflexion in the hardness

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DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Role of addition elements in the hardening of alloys in the system Mg - Mn - Al - Ca at high temperatures. Trudy Inst. met. no.8:111-119 '61. (MIRA 14:10)
(Magnesium-manganese-aluminum alloys--Hardening)
(Metals at high temperatures)

SVIDERSKAYA, Z.A.; DRITS, M.Ye.; VASHCHENKO, A.A.

Effect of cold deformation on the properties of artificially aged aluminum alloys at high temperatures. Issl. splav. tsvet. met. no.3:48-57 '62. (MIRA 15:8)
(Aluminum alloys--Cold working)
(Metals at high temperatures)

S/806/62/000/003/007/018

AUTHORS: Drits, M. Ye., Sviderskaya, Z. A., Rokhlin, L. L.

TITLE: Investigation of the decomposition of a supersaturated solid solution of neodymium in magnesium.

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniye splavov tsvetnykh metallov. no.3. 1962, 68-74.

TEXT: The paper describes an experimental investigation of the decomposition of the supersaturated solid solution of Nd in Mg during artificial aging after quenching, a procedure which yields maximal hardness at room T and up to 250°C. Because of the substantial chemical similarity of the rare-earth elements having an identical structure of the outer electron shells, the investigation of the aging behavior of Nd was made in comparison with that of the widely utilized Ce. The two comparison alloys were prepared in an electric resistance furnace with steel crucibles. Two Nd-containing alloys (1.1% Nd and 2% Nd) and a 2.4%-Ce alloy were prepared. Rods 10.5-mm diam were hot-extruded; the Mg-Nd alloys were water quenched at 535°C, the Ce alloy at 575°. The pre-quench heating was performed by 4-hr soaking in a sulfurous atmosphere. The study of the aging process comprised a comparison of the changes in hardness (H_V), specific electrical resistance, and

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microstructure. X-ray metallography was not effective since the formation of the Mg-Nd solid solution produces only a relatively small change in lattice parameter because of the small solubility (in at.-%) of Nd in Mg. 2- to 100-hr aging of the 1.1% Nd alloy was performed at 150, 175, 200, 250, and 300°C. Curves reveal a H_V maximum at a fairly constant H_V level up to 200°, but which is attained after aging times that decrease with increasing T, and with H_V values decreasing both in value and in time of attainment at higher T. The resistance (R) measurements show a drop in R with aging time and an increase in steepness of the drop with aging T. This drop in R is attributed to a segregation from the supersaturated solid solution of particles of a second Nd-rich phase. No "first-stage" aging phase accompanied by an increase in R, comparable to that of Al alloys, is observed. Verification tests comparing the hardness and the R of specimens aged at room T and briefly at 150°C showed that an increase in H_V occurred only in conjunction with a drop in R, which indicates that in the aging of Mg-Nd alloys the hardening is attributable solely to the segregation of crystals of a Nd-rich phase from the supersaturated solid solution. Microscopically the segregation of the second-phase particles required much more time to become evident than did the R-drop indication. The first Nd-rich crystals appeared predominantly along the grain boundaries, but subsequent crystals could be identified even within the solid-solution crystals. The growth of the crystals became more pronounced with increasing T and lengthening aging time; it was more

evident in the 2%-Nd alloy. Comparison observations of the 2%-Nd and the 2.4%-Ce alloys showed them to be maximally supersaturated solid solutions. Comparative R and H_V measurements show a drop in R up to 250° and a constant R at higher aging T for both alloys. Max H_V for the Ce alloy occurs at 170°, for the Nd alloy 190°C; the relative gain in H_V is greater for the Nd alloy. A comparison of the one-hour Brinell hardnesses of the 3 alloys tested suggested that the quenched solid solution of Mg with 2% Nd is more highly concentrated than the other 2 alloys, and that upon aging the quantity of second phase in the form of dispersed particles in that alloy is greater. This is taken to indicate that the role of dispersed particles, segregated in the decomposition of a supersaturated solid solution, in the hardening of Mg alloys is considerably greater at 250° than at room T. There are 4 figures, 1 table, and 12 references (8 Russian-language Soviet and 4 English-language).

ASSOCIATION: None given.

DRITS, M.Ye.; MAL'TSEV, M.V.; SVIDERSKAYA, Z.A.; PADEZHNOVA, Ye.M.; TROKHOVA, V.F.

Effect of additional alloying on the properties of alloys in the system Mg - Th - Mn. Issl. splav. tsvet. met. no.3:86-92 '62. (MIRA 15:8)

(Magnesium-thorium-manganese alloys)

S/149/62/000/003/006/011
A006/A101

AUTHORS: Drits, M. Ye., Sviderskaya, Z. A., Rokhlin, L.L.

TITLE: The effect of some elements upon the mechanical properties of magnesium-neodynium alloys

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, no. 3, 1962, 117 - 121

TEXT: The investigation was made with magnesium-neodymium alloys in deformed state. Grade Mg1 magnesium (99.91% Mg), magnesium-neodymium addition-alloy, and magnesium addition-alloy with other metals, were used as charge materials for preparing the alloys to be investigated. The following components were added: cadmium, lithium, aluminum, zinc, tin, bismuth, calcium, manganese, silicon, barium and cobalt. The alloys were heat-treated by quenching and artificial aging. The quenching temperature for the alloys was 535°C, with the exception of Zn and Ca (435 - 515°C). The specimens were quenched for 4 hours in sulfur dioxide atmosphere and air-cooled. Aging was performed at 175°C for 24 hours. The tests show that none of the alloying components used caused a sub-

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stantial increase of strength properties, although slight effects were observed in some cases. Cadmium and manganese raised yield strength and silicon increased ultimate strength; some strength increase was observed in alloying with cobalt. At elevated temperatures a slight increase in strength was caused by the addition of cadmium (at 200°C) and manganese, cobalt and silicon (at 300°C). The addition of lithium, barium and calcium did not change the properties of magnesium-neodymium alloys. Aluminum, tin, bismuth and zinc reduced considerably ultimate strength and yield point, and raised relative elongation. Investigations of the microstructure of deformed alloys show that the neodymium-phase crystals, observed in cast state, dissolve during quenching, and that the neodymium passes into a magnesium-base solid solution in the case when the mechanical properties are not affected or only slightly raised by the alloying admixture. A connection between the neodymium solubility, reduced by some elements, and a decrease in strength was established. This article was recommended for publication by the kafedra tekhnologii metallov (Department of Metal Techniques) at the Vsesoyuznyy zaochnyy institut tekstil'noy i legkoy promyshlennosti (All-Union Correspondence Institute of Textile and Light Industry). There are 3 tables and 2 figures.

ASSOCIATION: Institut metallurgii imeni A. A. Baykova (Institute of Metallurgy imeni A. A. Baykov)

SUBMITTED: January 2, 1962.

S/129/62/000/011/006/007
E073/E535

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A. and Kadaner, E.S., Candidates of Technical Sciences and Fel'gina, S.B., Engineer

TITLE: Influence of manganese, aluminium and calcium on the kinetics of recrystallization of magnesium

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no.11, 1962, 28-31

TEXT: The kinetics of recrystallization were studied for magnesium and magnesium alloys with 0.05-0.09 and 0.9 at.% Mn, Al and Ca produced from 99.91% pure magnesium, 99.98% pure aluminium, sublimated calcium and Mg-Mn alloy. Ingots weighing 0.5 kg from chill moulds were subjected to rolling in two passes. The final rolling was with a reduction of 60% after heating the blanks to 300°C. The conditions of deformation were chosen to prevent recrystallization and to obtain a high quality, crack-free material. Subsequent annealing was at 65-275°C for durations of between 1 min and 40 hours. The kinetics of recrystallization were studied by subjecting an annealed specimen to local

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deformation, i.e. by indenting with a ball using a hardness-test instrument, followed by annealing at various temperatures; the process of recrystallization was investigated by observing the formation of the finest grains in the indented zone. The time until recrystallization commences decreases with increasing annealing temperature; for magnesium this time decreases from 10 hours to a few minutes on increasing the annealing temperature from 65 to 150°C. For alloys with 0.1 wt.% Mn or Al the decrease is from 13 and 18 hours, respectively, to 3 min if the annealing temperature is increased from 75 to 150°C. The activation energy of pure magnesium was determined as being 17.5 kcal/g·atom, which is about half the published value (32 kcal/g·atom) of the activation energy of self-diffusion. This leads to the conclusion that the mechanism of recrystallization differs from the mechanism of self-diffusion. In the case of low contents of alloying elements, an increase of the time until recrystallization commences corresponds to an increase in the activation energy, whereby the maximum increase in the activation energy occurs when magnesium is alloyed with calcium, which has the strongest braking effect on crystallization. An increase in the

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content of the alloying element did not affect the increase in the activation energy of Mg-Al alloys and, in the case of Mg-Mn and Mg-Ca alloys, it even reduced it somewhat. This differing behaviour is attributed to the differing ratios of the atomic dimensions of the alloying elements and the base metal. This dimensional factor also determines the interaction of the components, particularly the limit solubility in the solid state. The braking of the recrystallization process will be the more intensive the lower the solubility of the element in solid magnesium. The presence in the structure of particles of other phases also causes some braking of the process of recrystallization. However, the effect of the alloying element basically manifests itself at concentrations at which the element enters into the solid solution. There are 3 figures and 1 table.

ASSOCIATION: Institut metallurgii imeni A. A. Baykova
(Institute of Metallurgy imeni A. A. Baykov)

DRITS', M.Ye. (Moskva); SVIDERSKAYA, Z.A. (Moskva); ROKHLIN, L.L. (Moskva)

Hardening of alloys in the system magneisum - neodymium by means of thermomechanical treatment. Izv. AN SSSR. Otd. tekh. nauk. Met. i topl. no.5:191-196 S-O'62. (MIRA 15:10)
(Magnesium-neodymium alloys--Hardening)

DRITS, M. Ye. (Moskva); SVIDERSKAYA, Z. A. (Moskva); KUZ'MINA, V. I. (Moskva)

Effect of iron, silicon, and manganese on the properties of aluminum-copper-lithium alloys. Izv. AN SSSR. Otd. tekh. nauk. Met. i topl. no.6:150-158 N-D '62.
(MIRA 16:1)

(Aluminum-copper-lithium alloys—Testing)

DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Study of the Mg-Nd-Mn alloys in the region adjoining the magnesium angle of the system. Zhur.neorg.khim. 7 no.12: 2771-2777 D '62. (MIRA 16:2)
(Magnesium-neodymium-manganese alloys)

S/509/62/000/011/009/019
E071/E351

AUTHORS: Drits, M.Ya., Sviderskaya, Z.A., Rokhlin, L.L., Padezhnova, Ye.M. and Yakovleva, L.I.

TITLE: The relationship between strength at elevated temperature and composition of magnesium-base alloys

SOURCE: Akademiya nauk SSSR. Institut metallurgi. Trudy. no. 11. Moscow, 1962. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya. 124 - 132

TEXT: A study of the relationship between composition and strength at high temperatures for deformed and heat-treated magnesium alloys was carried out, as the only available data covered a limited number of alloys, in the cast state. The binary alloys investigated over a temperature range of 150 - 300 °C were: Mg-Al; Mg-Zn; Mg-Mn; Mg-Th; Mg-Ce; Mg-Nd and Mg-Ca. Cast ingots, after cleaning by machining, were pressed into rods, 10.5 mm in diameter, being deformed by 88%. The Mg-Al and Mg-Zn alloys were homogenized before pressing (at 400 and 340 °C, respectively) for 50-60 hours; the remaining alloys were not homogenized. The pressing temperature was 300 - 440 °C, the temperature

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The relationship between ....

of the container being 250 - 400 °C. Specimens prepared from these rods were hardened in water at 60 - 70 °C, Mg-Al from 415 °C, Mg-Zn from 315 °C, Mg-Mn, Mg-Th and Mg-Ce from 550 °C, Mg-Nd from 520 °C and Mg-Ca from 490 °C, following which they were stabilized at the test temperature for 100 hours. The strength-testing of the alloys at elevated temperatures was carried out by determination of the hardness under prolonged loading (hours). The results showed that the best structure for obtaining the maximum heat-resistance would be different for each system, depending on the nature of the intermetallic components. In systems having a high solubility of the alloying element in solid magnesium and marked changes in solubility with temperature, the best structure is a highly-alloyed solid solution (Mg-Al, Mg-Zn). This is particularly the case at higher temperatures. In such systems an intense development of the interactions at the inter-phase boundaries and a strong tendency to weakening in the second phase itself lead in most cases to heterogenization of the structure having little effect. In systems with a severely limited

S/509/62/000/011/009/019
E071/E351

The relationship between ....

alloying-element solubility in solid magnesium and a small change in the solubility with temperature, the strongest effects of alloying are shown by those with a structure of decomposed solid solution (Mg-Mn, Mg-Th, Mg-Ce, Mg-Nd, Mg-Ca). The appearance in the alloy structure of dispersed particles of heat-resistant secondary phases and the absence of noticeable interaction at the interphase boundaries at elevated temperatures allow heterogenization to exert a strong influence. A comparison of the authors' results and the published data show a correspondence in the nature of the relationships despite the fact that the authors' results were obtained on deformed and heat-treated materials, and the published data were for cast alloys. There are 5 figures.

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ACCESSION NR: AT4009498 S/2509/63/000/014/0120/0129

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Rokhlin, L. L.

TITLE: Effect of additional alloying elements on the properties of alloys in the Mg-Nd system

SOURCE: AN SSSR. Institut metallurgii. Trudy*, no. 14, 1963. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody* issledovaniya, 120-129

TOPIC TAGS: alloy, alloy mechanical property, magnesium, neodymium, magnesium alloy, magnesium neodymium alloy, magnesium neodymium manganese alloy, manganese admixture, cadmium admixture, nickel admixture, silver admixture

ABSTRACT: Magnesium-neodymium systems possess very good mechanical properties at temperatures of 200-300C, making them very useful in industry. Previous studies have shown that these properties can be improved further by the addition of zirconium to cast alloys or of elements such as Mn, Ni, Zn and Ag to deformed alloys. The present study dealt with the effect of 13 alloying elements (Cd, Li, Al, Ag, Zn, Pb, Bi, Ca, Mn, Si, Ba, Ni and Co), separately and in combination, on the mechanical properties of deformed Mg-Nd alloys. The alloys were prepared in an electric furnace under a V12 flux. After heat treatment (420-460C), the alloys

ACCESSION NR: AT4009498

were subjected to hot pressing (88% compression), annealed in air at 535C and aged at 175C for one day. Comparison of the mechanical properties at 250C showed that individual addition of most of these elements to an Mg-Nd alloy containing 2.5% Nd had no significant effect on strength, although Co had some positive effect, the yield point was increased by Cd and Mn, and the ultimate strength was increased by Si. Addition of Al, Sn, Bi or Zn decreased the ultimate strength and yield point at 250C and increased the plasticity. Examination of the microstructure by etching with 0.5% HNO_3 also showed no effect except in the case of Al, Sn or Bi which led to the appearance of a microgranular eutectic resulting from a decrease in the solubility of Nd in Mg; although Zn did not change the microstructure, it decreased the melting point. When Cd, Ag or Ni were added to a Mg-Nd-Mn alloy, the first two had little effect on strength but increased the yield point at room temperature (in the case of Ag, there was no effect at 300C, while at 250C the ultimate strength decreased and the yield point increased); Ni, however, increased the ultimate strength at high temperatures, while at room temperature there was little change in strength and the yield point decreased. Essentially the same effects were produced when Cd or Ag were added to a Mg alloy containing 2.5% Nd, 1.5% Mn and 0.2% Ni, the best properties being obtained with 1.83% Cd. The microstructure of the ternary alloy was unchanged by addition of Cd, but Ag and Ni resulted in the appearance of new phases of Mg_2Ni and Mg_3Ag. "Engineer

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ACCESSION NR: AT4009498

L. N. Dmitrova also took part in the work." Orig. art. has: 6 tables and 4 figures.

ASSOCIATION: Institut metallurgii AN SSSR (Metallurgical Institute, AN SSSR)

SUBMITTED: 00 DATE ACQ: 25Jan64 ENCL: 00

SUB CODE: MM NO REF SOV: 004 OTHER: 004

Card 3/3

DRITS, M.Ye.; KADANER, E.S.; Prinimali uchastiye: FEL'GINA, S.B., inzh.; ORESHKINA, A.A., inzh.

Recrystallization and recovery of magnesium alloys. Issl. splav tsvet. met. no.4:211-223 '63. (MIRA 16:8)

(Magnesium alloys—Metallography)
(Strains and stresses)

S/279/63/000/001/022/023
E040/E451

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A., Kadaner, E.S., Fel'gina, S.B. (Moscow)

TITLE: Effect of some alloying elements on the recrystallization of magnesium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i gornoye delo. no.1, 1963, 191-198

TEXT: The effects were studied of the addition of thorium, neodymium, zirconium, nickel and barium on the recrystallization of magnesium, and its relationship with the strengthening and weakening of magnesium alloys at various temperatures. The test alloys were prepared from MPI (MGI)-grade of magnesium (99.91% Mg), electrolytic nickel, barium (99.99% Ba), neodymium (99.9% Nd) and thorium (99.5% Th). The alloying additions were between 0.1 and 2.0 wt.% with Mg-Ba and Mg-Ni alloys, 0.1 and 0.6 wt.% with Mg-Zr alloys, 0.2 and 1.0 wt.% in Mg-Th alloys and from 0.1 to 4 wt.% in Mg-Nd alloys. All the test alloys were hot-deformed, cold-deformed and annealed at temperatures of 50 to 450°C for one hour before microstructural and X-ray examinations, in order to

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determine the initial and final temperatures of recrystallization. The experimentally established phase diagrams of the various binary alloys produced from the results are given together with a graph showing the recrystallization kinetics of magnesium-base test alloys. The effect of the alloying elements on the physico-mechanical properties of the test alloys was investigated in detail and the data obtained are tabulated, the effect of each alloying element being examined individually. In most cases, recrystallization of magnesium-base alloys was found to depend mainly on the chemical reaction of the constituents, but the dimensional factor was also found to be prominent in some cases. Soluble alloying elements inhibit the recrystallization of magnesium much more than the insoluble ones but only if the influence of the dimensional factor is appreciable: e.g. 0.1 wt.% addition of zirconium to magnesium was found to have no effect on the recrystallization temperature of magnesium, as in this case the dimensional factor is nil, but a 0.15 wt.% addition of Zr raised the recrystallization temperature of magnesium quite significantly, due to the appearance of a second segregated phase.
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S/279/63/000/001/022/023
E040/E451

Effect of some alloying ...

Additions of thorium and neodymium raised the initial recrystallization temperature of magnesium alloys very considerably, and nickel and barium additions to a much smaller extent. The role of recrystallization in weakening magnesium-base alloys at elevated temperatures was examined by creep tests on Mg-Ni specimens carried out for 100 hours at 200°C under a stress of 1.75 kg/mm^2, after prior annealing at 450°C for 1 hour. Hardness tests were carried out on specimens with 0.14% Ni at the test temperature of 125°C. The data obtained are tabulated and their significance is assessed. It is concluded that recrystallization plays an important role in the deformation resistance of Mg alloys at elevated temperatures. There are 6 figures and 3 tables.

SUBMITTED: April 20, 1962

Card 3/3

DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Effect of plastic deformations on the properties and structure of aging magnesium alloys containing neodymium. Issl. splav. tsvet. met. no.4:157-170 '63. (MIRA 16:8)

(Magnesium alloys—Metallography)
(Deformations (Mechanics))

DRITS, M.Ye. (Moskva); SVIDERSKAYA, Z.A. (Moskva); KADANER, E.S. (Moskva); FEL'GINA, S.B. (Moskva)

Effect of thorium and zinc on the recrystallization of magnesium. Izv. AN SSSR. Met. i gor. delo no.5:129-133 S-O '63. (MIRA 16:11)

DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Constitutional diagrams of the systems magnesium - neodymium, and magnesium - cerium. Trudy Inst. met. no.12:143-151 '63. (MIRA 16:6)

(Magnesium-neodymium alloys—Metallography)
(Magnesium-cerium alloys—Metallography)
(Phase rule and equilibrium)

DRITS, M. Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Effect of addition elements on the properties of alloys in the system M - Id. Trudy inst. met. no.14:120-129 '63
(MIRA 17:8)

L 12599-63 BDS/EWP(q)/EWT(m) AFETC/ASD JD

ACCESSION NR: AP3003477 S/0078/63/008/007/1661/1667

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AUTHOR: Drits, M. Ye.; Kadaner, E. S.; Padezhnova, Ye. M.

TITLE: Phase diagram of the aluminum-manganese-cadmium system in the area of high aluminum concentration

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 7, 1963, 1661-1667

TOPIC TAGS: Al, Mu, cadmium, mechanical property, corrosion property, eutectic property

ABSTRACT: Research on the interaction of components in the system Al-Mn-Cd is of practical interest since alloying with manganese and cadmium indicates a favorable effect on mechanical and corrosion properties. Study of the ternary diagram for Al-Mn-Cd was begun from triangulation of the system by 2 polythermal sections with constant content of aluminum equal to 99 and 95% in order to determine that in the aluminum angle there are 3 areas of primary crystallization: MnA_{14}, MnA_{16} and Alpha. The data obtained agreed best with results of work by Dix, Fink and Wiley which determined

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L 12599-63
ACCESSION NR: AP3003477

eutectic temperature at 658.5C, content of manganese at eutectic 1.95%, temperature of first peritectic reaction during cooling 680F and during heating 710C. Orig. art.has: 9 figures.

ASSOCIATION: none

SUBMITTED: 2Aug62 DATE ACQ: 02Aug63 ENCL: 00

SUB CODE: CH, ML NO REF SOV: 003 OTHER: 016

Card 2/2

DRITS, Mikhail Yefimovich; ODING, I.A., otv. red.; MUKHIN, G.G., red.izd-va; KISELEVA, A.A., tekhn. red.; DOROKHINA, I.N., tekhn. red.

[Magnesium alloys for work at high temperatures; properties of magnesium alloys depending on compsotion, structure and temperature] Magnievye splavy dlia raboty pri povyshennykh temperaturakh; svoistva magnievykh splavov v zavisimosti ot sostava, struktury i temperatury. Moskva, Izd-vo "Nauka," 1964. 228 p. (MIRA 17:3)

1. Chlen-korrespondent AN SSSR (for Oding).

ACCESSION NR: AP4039264 S/0078/64/009/006/1397/1402

AUTHOR: Drits, M. Ye.; Kadaner, E. S.; Padezhnova, Ye. M.; Bochvar, N. R.

TITLE: Determination of the boundaries of mutual solubility of manganese and cadmium in solid aluminum

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 6, 1964, 1397-1402

TOPIC TAGS: aluminum, cadmium, manganese, aluminum alloys, phase equilibria, electric properties, microstructure, solubility, mutual solubility

ABSTRACT: A small amount of cadmium in aluminum alloys has an extremely beneficial effect on the mechanical as well as the corrosion properties of the alloy. Consequently, in recent years cadmium is used as an alloying element in aluminum alloys which are used under deformation conditions, specifically in the refractory alloy of the system Al-Cu-Li-Mn-Cd. In order to determine the nature of the strengthening of cadmium containing aluminum alloys it is necessary to have data on the nature of the interaction of cadmium with aluminum and other alloying components. This work was concerned with the determination of the mutual solubility of cadmium and manganese in solid aluminum. In this investigation binary and ternary alloys

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ACCESSION NR: AP4039264

were prepared containing up to 2 % of manganese and up to 1 % of cadmium. The determination of the solubility was conducted by the microscopic analysis method of the faces of specimens which were subjected to preliminary electrolytic polishing and measurement of electrical systems. The solubility of cadmium and manganese in aluminum is shown in figure 1. Orig. art. has: 4 tables and 4 figures.

ASSOCIATION: None

SUBMITTED: 04Jul62 ENCL: 01

SUB CODE: MM NO REF SOV: 002 OTHER: 013

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ACCESSION NR: AP4039264 ENCLOSURE: 01

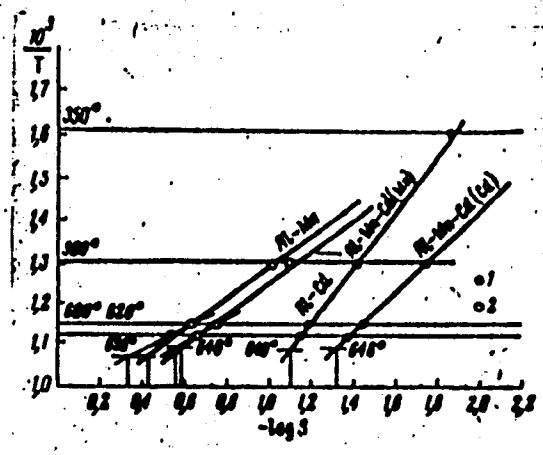

Fig. 1. Solubility of manganese and cadmium in aluminum: 1- Cd; 2- Mn. T is the absolute temperature and S is the maximum concentration of the dissolved element expressed in at. percent.

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AM4016105 BOOK EXPLOITATION S/

Drits, Mikhail Yefimovich

Magnesium alloys for operations at elevated temperatures; properties of magnesium alloys dependent on composition, structure, and temperature (Magniyevy*ye splavy* dlya raboty* pri povy*shenny*kh temperaturakh; svoystva magniyevy*kh splavov v zavisimosti ot sostava, struktury* i temperatury*). Moscow, Izd-vo "Nauka", 1964. 228 p. illus., biblio. Errata slip inserted. 2200 copies printed.

TOPIC TAGS: magnesium alloy, heat resistant magnesium alloy, alloy heat resistance, binary magnesium alloy, ternary magnesium alloy, quarternary magnesium alloy, cast alloy rupture strength, wrought alloy rupture strength, complex alloy, alloy property

PURPOSE AND COVERAGE: This book is intended for engineering personnel of scientific research institutes and metallurgical and metal-working plants. It may also be useful to students and aspirants specializing in the metallurgy of light alloys. The book deals with the urgent problems of studying the heat resistance of magnesium alloys and of developing new magnesium-base alloys which can be used at

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elevated temperatures. Considerable attention is paid to the effect of alloying on the strengthening and softening processes in magnesium alloys during heating. Data characterizing the role structure plays in ensuring the heat resistance of magnesium alloys are presented. The part devoted to physicochemical analysis of ternary and more complex magnesium-base alloys is of particular interest. Also discussed are the laws governing the relationship between the composition, structure, and heat resistance of magnesium alloys.

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AM4016105

SUB CODE: ML SUBMITTED: 28Nov63 NO REF SOV: 213

OTHER: 045 DATE ACQ: 07May64

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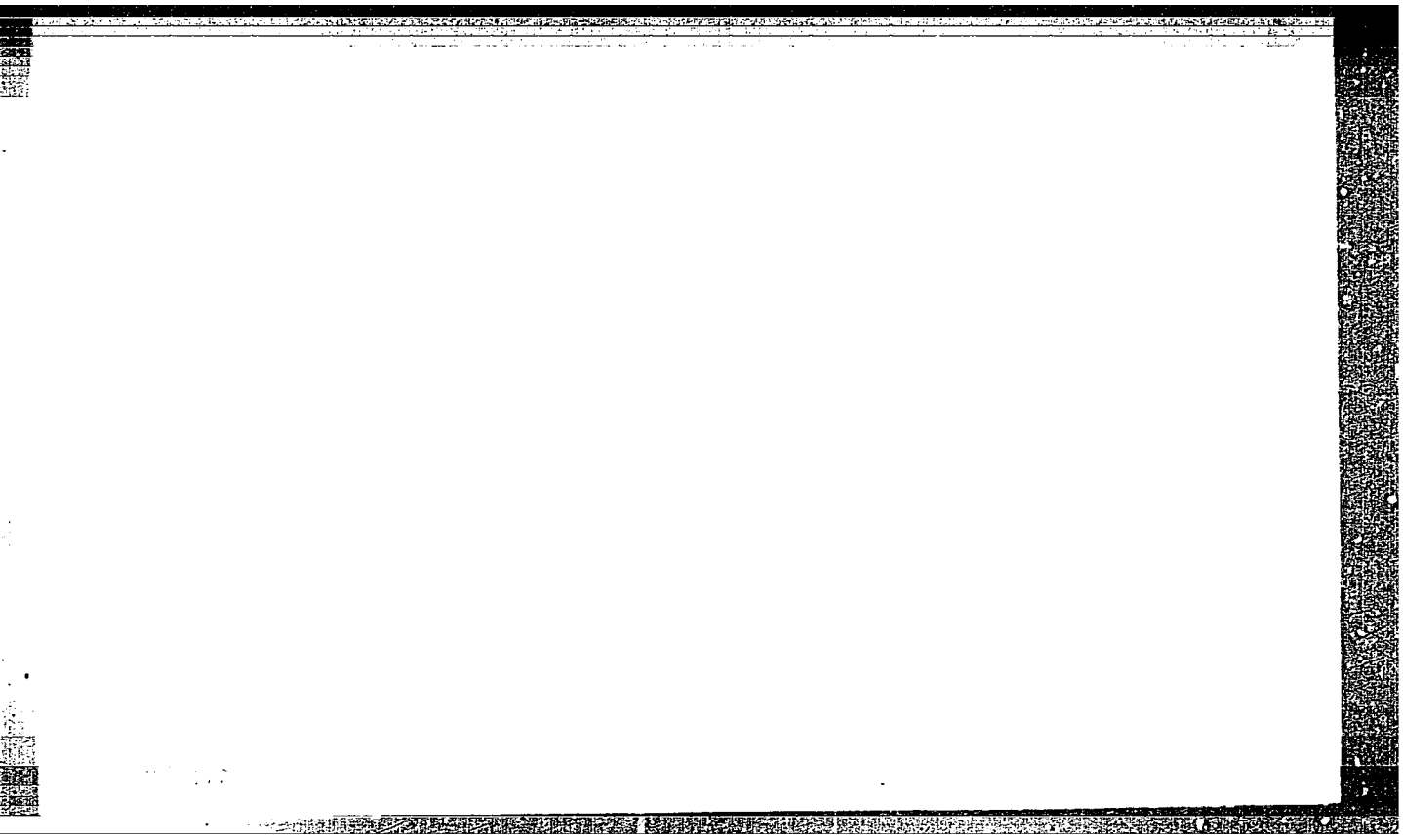
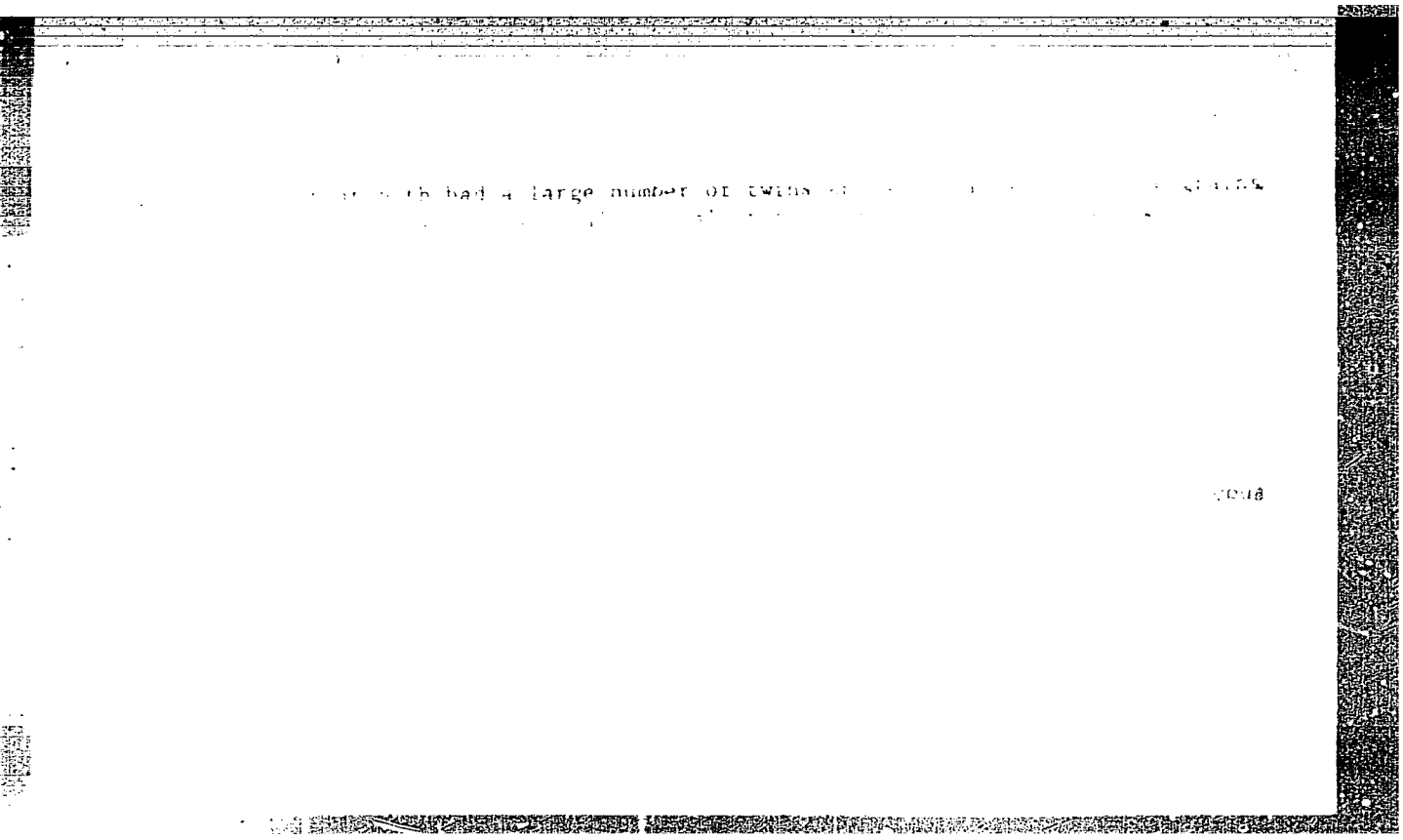
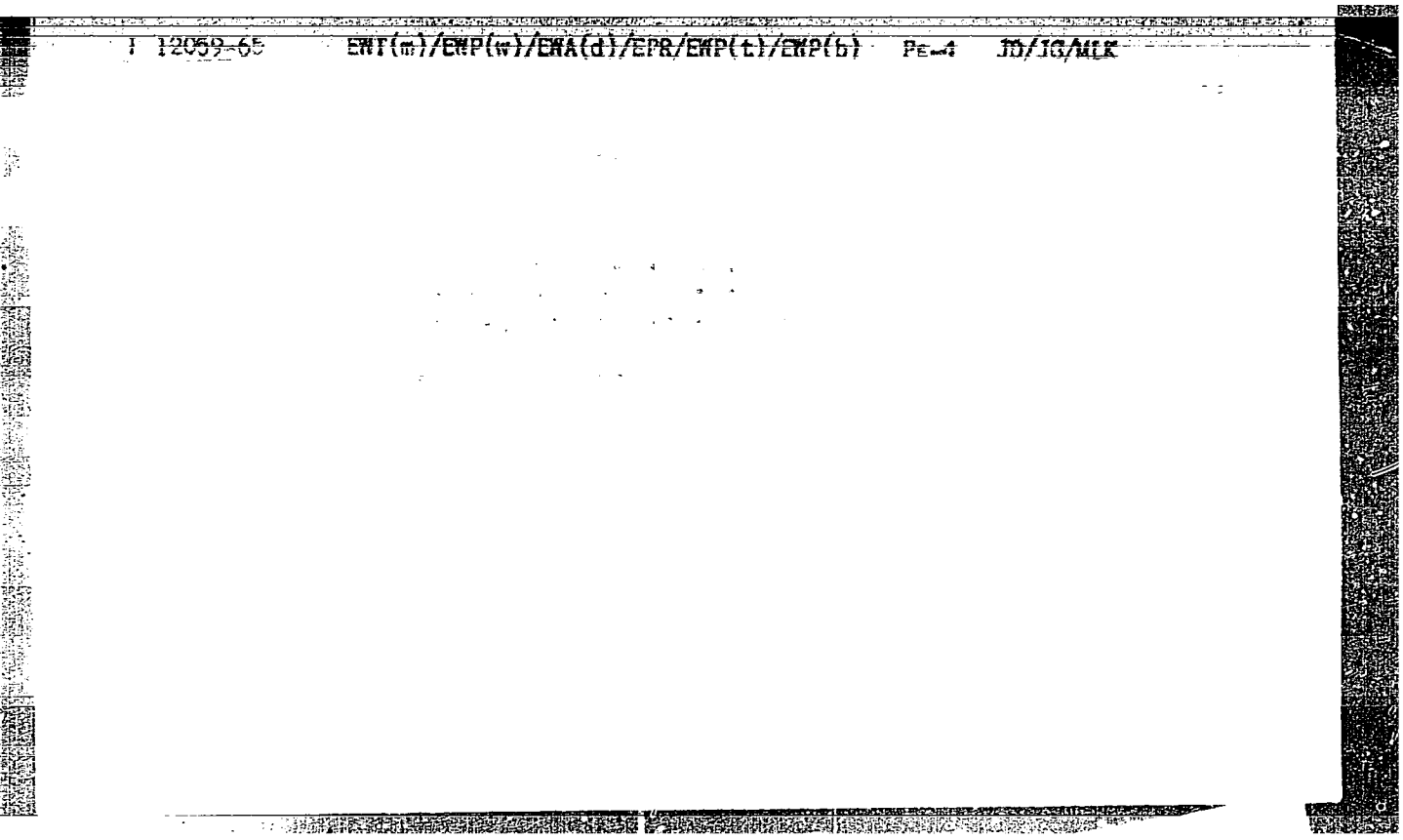
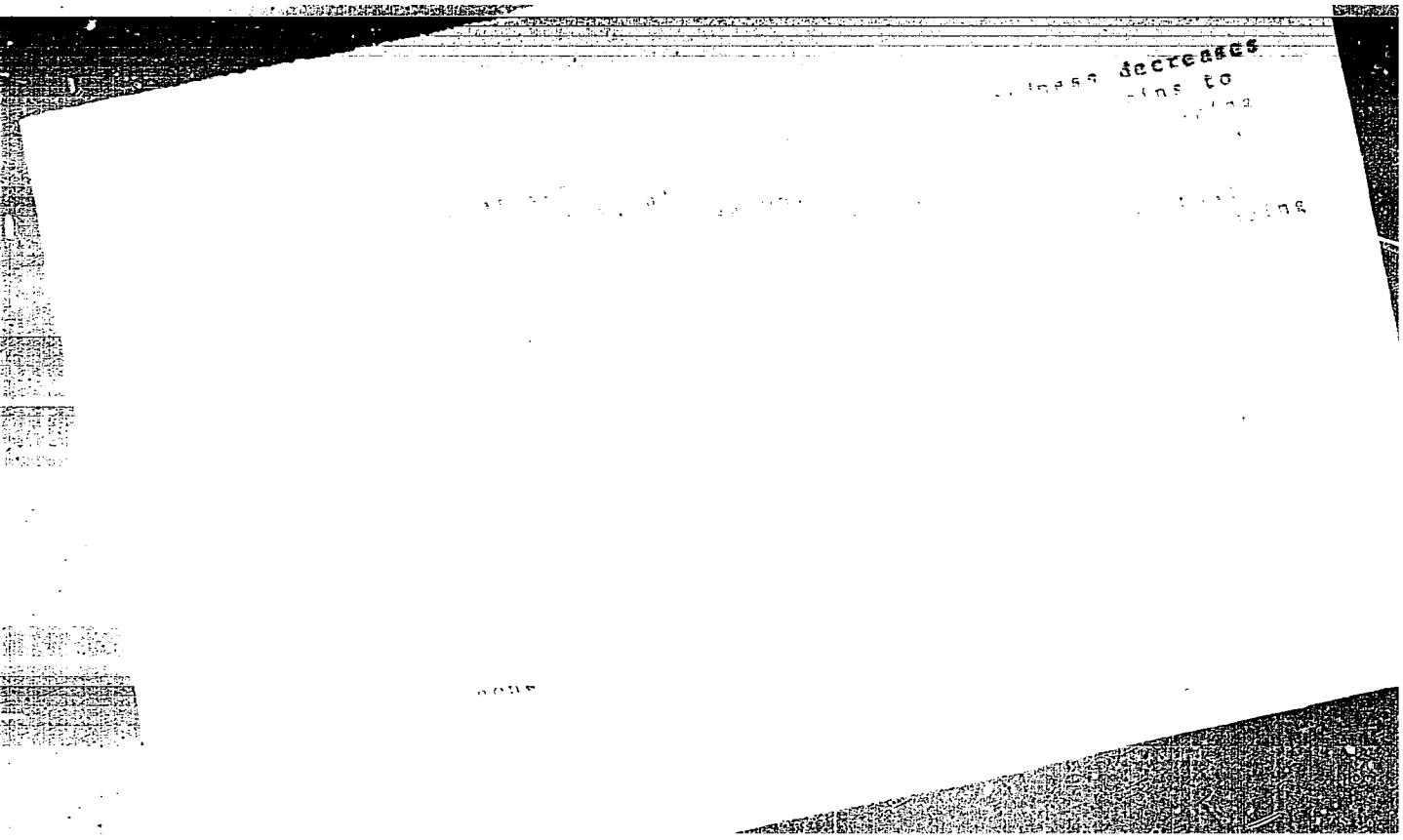
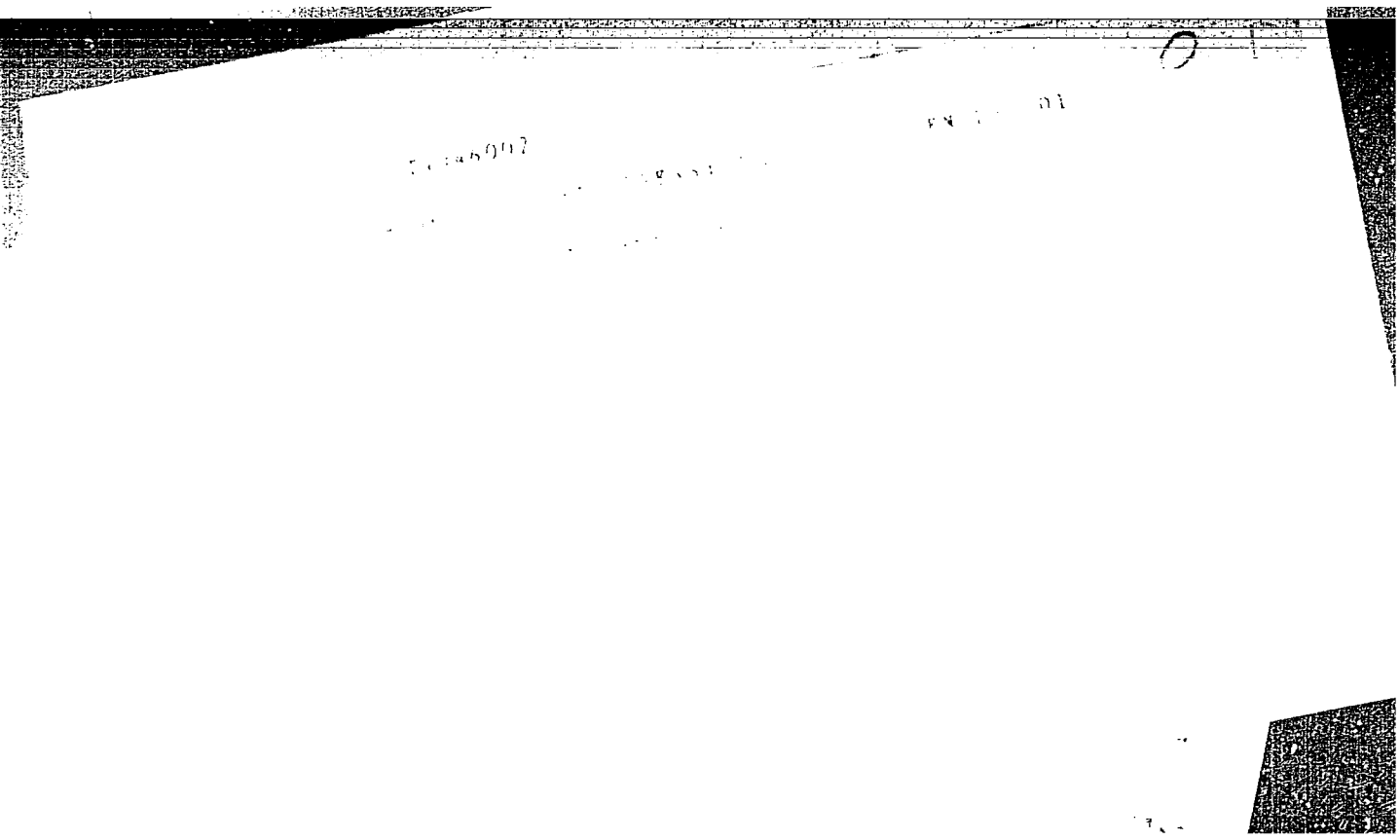


APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041121(









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L 12059-65

ACCESSION NR: AT4046002

ENCLOSURE: 01

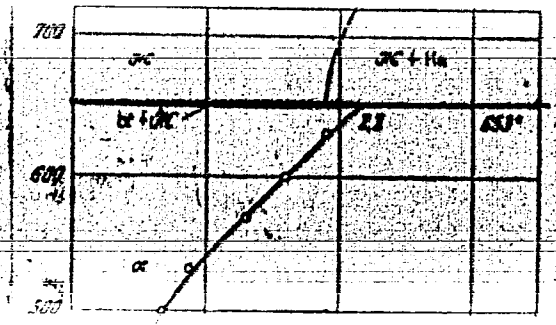

Fig. 1. Phase diagram of the Mg-Mn alloy

α - solubility of manganese in mag-

ACC NR: AP5027095

UR/0149/65/000/005/0101/0107
669.721

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Trokhova, V. F.

TITLE: Properties of lithium-containing magnesium alloys

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 5, 1965, 101-107

TOPIC TAGS: lithium containing alloy, magnesium base alloy, crystal lattice, hardness, tensile strength, compressive strength, plasticity

ABSTRACT: Alloying Mg with Li produces alloys of a density lower than that of the normally used Mg alloys (1.3-1.6 g/cm^3). Moreover, when the Li content exceeds 11%, the close-packed hexagonal lattice of Mg changes to a body-centered cubic lattice, thus assuring an exceptional suitability for pressworking. The available literature indicates that the properties of these alloys are greatly affected by the purity of starting materials, and particularly by the Na content (an impurity of Li), as well as by the conditions of the preparation and processing of the alloys. This complicates a comparison of the findings of individual investigators, particularly since the conditions under which the alloys are obtained are not always reported. To fill this gap, the authors investigated the properties of binary and certain ternary Li-containing Mg alloys prepared under fixed conditions from Mg (99.1% pure, electrolytic Li (99.7% pure, containing 0.15-0.20% Na), A00 Al (99.7% pure), and KDO Cd (99.97%

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pure). Depending on the amount of Li added, the Na content of the alloys varied from 0.01 to 0.04%. The specimens for mechanical tests were prepared from hot-pressed rods. On alloying Mg with Li, the hardness of the alloys increases until the two-phase region $\alpha + \beta$ is attained (5-7% Li). As the Li content is further increased, transition to the β-solid solution region takes place and, in alloys with 12-14% Li, the hardness falls below the hardness of pure Mg. The presence of Li in the alloys hardens them to a comparatively small extent (at 5-7% Li the hardness is only 5-6 kg/mm^2 higher than the hardness of Mg). The same may be said of the effect of Li on compressive and tensile strength of the alloys: the values of this strength are somewhat higher than for pure Mg when the Li content is 3-7% (when the alloys have a two-phase structure), but they decrease once transition to the β-phase region takes place. If the Li content is below 3%, the structure of the alloys is an α-solid Mg-base solution. This pattern is to a large extent offset in ternary Mg alloys where the presence of Al or Cd as the third alloy element markedly enhances the hardness and the tensile and compressive strength, particularly when Al is used. The best combination is that of alloys containing 2-5% Li and 5-10% Al, as then tensile strength is 27-33 kg/mm^2 and yield point = 17-22 kg/mm^2. Allowance must be made, however, for the adverse effect of Al on the plasticity of the alloys, due to the appearance of brittle intermetallic phases in their structure. Evidently, the optimal content of Al must be determined on taking into account the concentration of Li and other alloy elements, as well as the

L 5375-66

ACC NR: AP5027095

3

presence of impurities. Orig. art. has: 5 figures, 2 tables.

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Baykov Institute of Metallurgy)

SUBMITTED: 18Jun64 ENCL: 00 SUB CODE: MM, SS

NO REF SOV: 003 OTHER: 011

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L 1707-66 EWT(d)/EWT(m)/EWP(w)/EPF(n)-2/EWP(v)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c)
ACCESSION NR: AP5021222 IJP(c) MJW/JD/WW/HM/JG/EM UR/0125/65/000/008/0026/0030
621.791.0:620.183:546.3-19

AUTHOR: Drits, M. Ye. (Doctor of technical sciences); Kadaner, E. S. (Candidate of technical sciences); Vashchenko, A. A. (Engineer)

TITLE: Study of the structure of the welded joints of some aluminum alloys

SOURCE: Avtomaticheskaya svarka, no. 8, 1965, 26-30

TOPIC TAGS: aluminum alloy, zinc containing alloy, magnesium containing alloy, manganese containing alloy, zirconium containing alloy, alloy welding, alloy weld, weld structure

ABSTRACT: The structure of the welded joints of two AMts-type aluminum alloys containing 1) 4.6% Zn, 1.9% Mg, 0.6% Mn and 2) 4.6% Zn, 1.9% Mg, 0.6% Mn, and 0.2% Zr has been investigated. Alloy sheets 2.5 mm thick were heat treated (solution annealed at 440C for 1 hr, water quenched, and aged at 100C for 100 hr) and TIG welded with filler wire of the same composition. Microscopic examination showed that the segregation-induced heterogeneity of the solid solution and the precipitation of secondary phases at the grain boundaries occur mainly in the weld-adjacent zone, which makes this zone the most probable place for stresses and microcracks to

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L 1707-66

ACCESSION NR: AP5021222 3

originate. The addition of zirconium, in addition to refining the structure of the base metal, also modifies the structure of cast metal of the weld-adjacent zone and prevents the formation of a continuous network at grain boundaries. Orig. art. has: 6 figures. [AZ]

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute of Metallurgy)

44,55

SUBMITTED: 30Jul64 ENCL: 00 SUB CODE: MM

NO REF SOV: 003 OTHER: 001 ATD PRESS: 4093

Card 2/2

DRITS, M.Ye., doktor tekhn. nauk, otv. red.; BOCHVAR, A.A., akademik, red.; BELOV, A.F., doktor tekhn. nauk, red.; DOBATKIN, V.I., doktor tekhn. nauk, red.; MAL'TSEV, M.V., doktor tekhn. nauk, red.; FRIDLYANDER, I.N., doktor tekhn. nauk, red.; SVIDERSKAYA, Z.A., kand. tekhn. nauk, red.; YELAGIN, V.I., kand. tekhn. nauk, red.; BARBANEL', R.I., kand. tekhn. nauk, red.; SHAROV, M.V., kand. tekhn. nauk, red.; KADANER, E.S., kand. tekhn.nauk, red.; TROKHOVA, V.F., red.; CHERNOV, A.N., red.

[Metallography of light alloys] Metallovedenie legkikh splavov. Moskva, Nauka, 1965. 226 p. (MIRA 18:10)

1. Moscow. Institut metallurgii.

SVIDERSKAYA, Zoya Andreyevna; ROKHLIN, Lazar' Leonovich; DRITS, M.Ye., doktor tekhn. nauk, otv. red.; CHERNOV, A.N., red.

[Magnesium alloys containing neodymium] Magnievye splavy, soderzhashchie neodim. Moskva, Nauka, 1965. 137 p. (MIRA 18:7)

DRITS, M.Ye.; KADANER, E.S.; VASHCHENKO, A.A.

Study of the structure of weld joints in certain aluminum alloys. Avtom. svar. 18 no.8:26-30 Ag '65. (MIRA 18:11)

1. Institut metallurgii imeni Baykova, Moskva. Submitted July 30, 1964.

L 37169-66 EWT(m)/T/EWP(t)/ETI IJP(c) JH/JG/GD/JD

ACC NR: AT6016419 (A) SOURCE CODE: UR/0000/65/000/000/0125/0134

AUTHORS: Drits, M. Ye.; Sviderskaya, Z. A.; Gur'yev, I. I.; Rokhlin, L. L.; Oreshkina, A. A.

ORG: none

TITLE: Influence of temperature on the mechanism of plastic deformation of magnesium and magnesium alloy containing 3% neodymium

SOURCE: AN SSSR. Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 125-134

TOPIC TAGS: magnesium, magnesium alloy, neodymium containing alloy

ABSTRACT: The effect of temperature and additions of neodymium on the mechanism of plastic deformation of magnesium was investigated. The investigation supplements the results of Ye. M. Savitskiy, V. F. Terekhova, I. V. Burov, I. A. Markova, and O. P. Naumkin (Splavy redkozemel'nykh metallov. Izd-vo AN SSSR, 1962). The magnesium specimens were annealed at 425—450C for one hour. Specimens containing 3% neodymium were heated to 535C, quenched in water, and aged at 200C for 8 hours. The microstructure of the specimens was studied as a function of the annealing temperature and degree of deformation. The nature of the plastic deformation is different at high temperatures compared with low temperatures. The addition of 3% Nd to magnesium shifts the transition of the low-temperature plastic deformation mechanism to the

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L 37169-66

ACC NR: AT6016419

high-temperature mechanism by approximately 100C. It is concluded that the strengthening effect due to lattice deformation (which results from cold plastic deformation) persists up to 350C. Orig. art. has: 3 photographs.

SUB CODE: 11/ SUBM DATE: 16Sep65/ ORIG REF: 010/ OTH REF: 011

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L 40090-66 EWT(m)/EWP(w)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HW/JG/GD/JH

ACC NR: AT6016431 (A) SOURCE CODE: UR/0000/65/000/000/0217/0225

AUTHORS: Drits, M. Ye.; Gur'yev, I. I.; Vasil'yeva, N. I.; Ansyushina, A. Ye.

ORG: none

TITLE: Use of the method of thermomechanical processing for strengthening of semifinished products of alloy MA11

SOURCE: AN SSSR. Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 217-225

TOPIC TAGS: fabricated structural metal, mechanical property, mechanical heat treatment, metallography, ~~metal industry~~, metallurgical process, magnesium alloy / MA11 magnesium alloy

ABSTRACT: The effect of thermomechanical processing on the mechanical properties of alloy MA11 was studied in production conditions for both rolled and forged semifinish products. The chemical content of the material investigated was: 2.48% Nd, 1.77% Mn, 0.13--0.17% Ni, 0.05% Mn, less than 0.03% Cu, 0.007% Fe, less than 0.07% Si, and the balance magnesium. Mechanical properties were studied at both room temperature and higher temperatures. The limit of prolonged strength and creep was determined for 200, 250, and 300C. It was shown that the thermomechanical processing results in the obtaining of higher values of strength properties both at room and at higher temperatures; especially significant was the increase in the flow limit. Some lowering of plasticity was noted; however, the plasticity remained at a sufficiently high level.

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L 40090-66

ACC NR: AT6016431

The optimal degree of deformation for achieving high strength and acceptable plasticity is 10-15% and varies with processing temperature. The increase in values of thermomechanical properties is associated with distortions in the material crystal lattice and with variation in the dissociation of supersaturated hard mixture. It was also found that the thermomechanical processing has a beneficial effect on the corrosion resistance of MA11. N. N. Kulakov, N. A. Markova, and A. A. Shesterikova participated in the work. Orig. art. has: 3 figures and 9 tables.

SUB CODE: 11, 13/ SUBM DATE: 16Sep65/ ORIG REF: 005

L 44310-66 EWT(m)/EWP(t)/ETI IJP(c) JD/JG/JH

ACC NR: AP6019835 (A) SOURCE CODE: UR/0370/66/000/001/0149/0152

AUTHOR: Drits, M. Ye. (Moscow); Padezhnova, Ye. M. (Moscow); Bochvar, N. R. (Moscow)

ORG: none

TITLE: Constitution diagram of the Mg-Nd-Ni system in the Mg-rich region

SOURCE: AN SSSR. Izvestiya. Metally, no. 1, 1966, 149-152

TOPIC TAGS: phase analysis, ternary compound, magnesium base alloy, neodymium, nickel/ / FPK-55 thermal analyzer

ABSTRACT: Alloys of the Mg-Nd-Mn system containing small amounts of Ni display high mechanical properties at elevated temperatures. The elucidation of the role of Ni in strengthening the alloys of Mg with Nd and Mn as yet requires investigating the nature of the interaction between components in ternary (Mg-Nd-Mn, Mg-Nd-Ni and Mg-Mn-Ni) and quaternary (Mg-Nd-Mn-Ni) systems. In this connection, as well as considering that the constitution diagram of the Mg-Nd-Ni system in the Mg corner is as yet unknown, the article presents a diagram of the crystallization surface for this corner as based on the findings of thermal and microstructural analyses of Mg-Nd-Ni specimens specially melted in electric resistance furnaces

UDC: 669.017.13

under a layer of flux (55% LiCl and 45% KCl). The thermal analysis was carried out by plotting the heating and cooling curves with the aid of the FPK-55 thermal analyzer (heating and cooling rates both were ~2 deg/min). The investigation of the ternary diagram of Mg-Nd-Ni was commenced with two polythermic cross-sections for a fixed content of Mg (85 and 80% respectively) (Fig. 1) and it established that even minute additions of Ni to Mg-Nd alloys lead to the formation of a new ternary compound conditionally denoted as χ. In addition, it was possible to establish the presence of two new nonvariant transformations: peritectic at 468°C and eutectic at 455°C and to find that the phases Mg_9Nd, χ and Mg_2Ni are in an equilibrium with the Mg-base ternary solid solution. The plotted projection of the crystallization surfaces of the Mg-Nd-Ni system (Fig. 2) is such that the lines of the monovariant transformations e_1P and e_2E are drawn from the critical points of the binary system to the corresponding nonvariant points P and E across the compositions of the alloys present on the polythermic cross-sections at the points of contact between two-phase fields. The transformations taking place at these nonvariant points are described by the following scheme:

point P -- temperature 468°C -- $L_{29\%\ Nd,\ 13\%\ Ni} + Mg_9Nd \rightleftarrows a + \chi$

point E -- temperature 455°C -- $L_{26\%\ Nd,\ 17\%\ Ni} \rightleftarrows a + \chi + Mg_2Ni$

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ACC NR: AP6019835

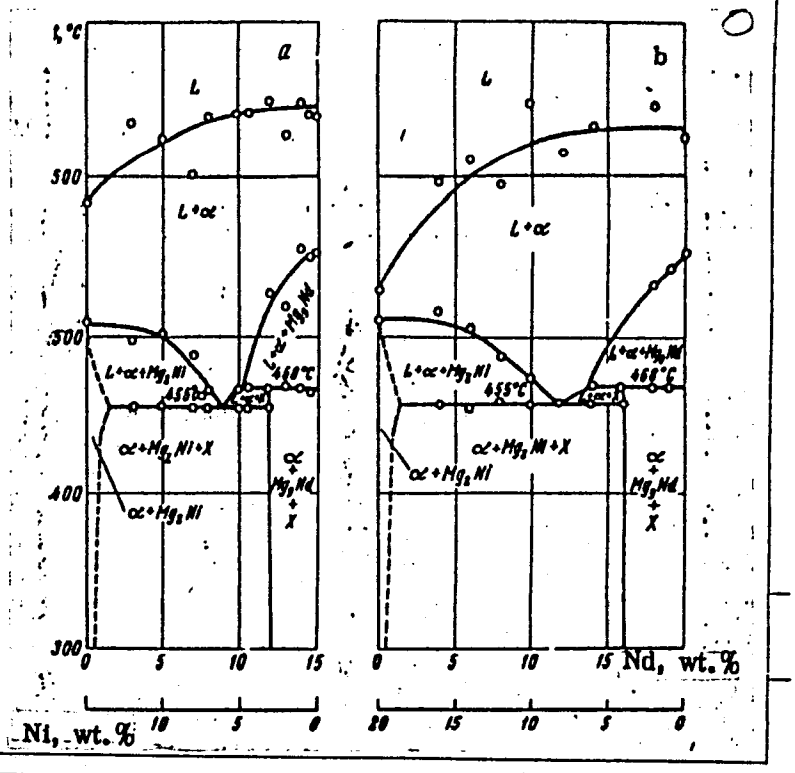

Fig. 1. Polythermic cross--sections of the Mg-Nd--Ni diagram with a fixed Mg content

(a - 85% mg; b - 80% Mg)

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L 44310-66
ACC NR: AP6019835

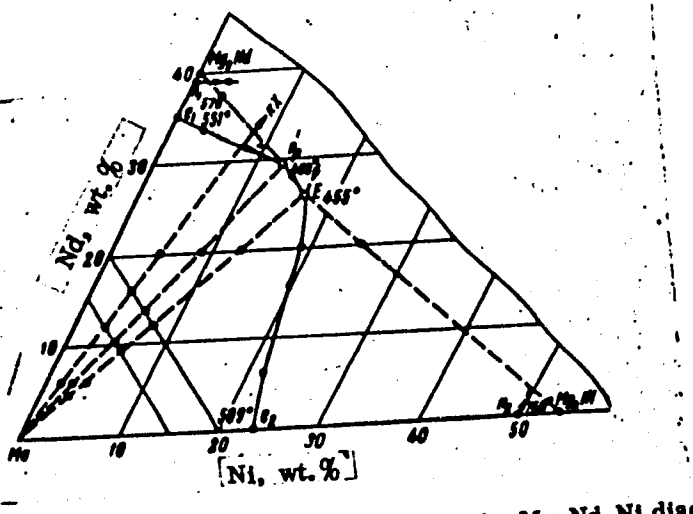

Fig. 2. Projection of the crystallization surfaces of the Mg-Nd-Ni diagram

Orig. art. has: 4 figures.
SUB CODE: 11, [redacted] 13/ SUBM DATE: 19Jun64/ ORIG REF: 004/ OTH REF: 002

L 32927-66 EWT(m)/EWP(t)/ETI IJP(c) JH/JD/JG/WB

ACC NR. AP6020915 SOURCE CODE: UR/0369/66/002/002/0183/0187

AUTHOR: Drits, M. Ye.; Kadaner, E. S.; Orekhova, A. N.; Romanov, V. V.

ORG: Institute of Metallurgy im. A. A. Baykov (Institut metallurgii)

TITLE: Effect of small additions of copper and silver on corrosion of Al-Zn-Mg alloys

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 2, 1966, 183-187

TOPIC TAGS: aluminum alloy, zinc containing alloy, magnesium containing alloy, copper containing alloy, silver containing alloy, alloy corrosion, stress corrosion, corrosion resistance

ABSTRACT: Cold- and hot-rolled sheets (2.5 mm thick) of high strength Al-Zn-Mg alloy containing a total of 7.5% Zn and Mg at a Zn/Mg ratio of 2, 0.6% Mn, 0.15% Zr, 0.2% Fe and 0.1% Si, and additionally alloyed with 0.3% each Cu and Ar, were tested for resistance to general and stress corrosion. Test specimens were solution annealed at 450C for 30 min, water quenched, and aged at 140C for 24 hr (temper T6) which ensured the highest strength characteristic of the alloy. Stress tests done in a 30 g/l NCl + 20 g/l $NaHCO_3$ solution under a stress equal to 0.8 of the yield strength showed that the initial alloy failed in 23 hr,

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while alloys with Cu, or Ar, or Cu and Ar did not fail even with 100—110 hr exposure. Alloying with silver was more effective in increasing the stress-corrosion resistance than alloying with copper, but the highest stress-corrosion resistance was achieved with combined alloying with both Cu and Si. Alloys (with Cu and Ar) additionally alloyed with 0.6% Mn or 0.3% Cr or 0.2% each Mn and Cr had still higher resistance to stress corrosion. These alloys did not fail in 200 hr under a stress equal to the yield strength, but their strength characteristics decreased somewhat compared with alloys without Mn or Cr. In prolonged stress-corrosion tests, the alloys with 0.3% Cu or 0.3% each Cu and Ar sustained a stress equal to 0.9 yield strength for 254—556 hr, while the initial alloy failed in 60 hr. In stress-corrosion tests under conditions of anodic polarization under a stress equal to 0.9 yield strength, the rupture life of the initial alloy increased from 25 to 51 min with alloying with Cu and Ar, and to 75—93 min with alloying with Cr. Additions of Cu and Ar, however, noticeably decreased the resistance of the alloy to general corrosion. This harmful effect can be reduced to some extent by additional alloying with Cr, which shows that the addition of Cr improves the alloy resistance to both general and the stress corrosion. The beneficial effect of additional Cr is probably associated with the increased stability of the protective oxide film on the metal. Orig. art. has: 4 tables. [MS]

SUB CODE: 11/ SUBM DATE: 23Aug65/ ORIG REF: 006/ OTH REF: 017/ ATD PRESS: 5128

L 42292-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/JH

ACC NR: AP6019774 SOURCE CODE: UR/0370/66/000/003/0165/0171

37
36

AUTHOR: Drits, M. Ye. (Moscow); Padezhnova, Ye. M. (Moscow)

ORG: none

TITLE: Phase composition and aging of alloys of the aluminum-copper-manganese-cadmium system

SOURCE: AN SSSR. Izvestiya. Metally, no. 3, 1966, 165-171

TOPIC TAGS: aluminum base alloy, phase composition, metal aging

ABSTRACT: The article gives the results of a study of the isothermal cross sections of alloys with a constant content of 0.5% manganese and 0.2% cadmium, and of an investigation of the effect of aging on some alloys. Materials for preparing the alloys to be tested were: aluminum (99.985%), cadmium (99.91%), and alloys made of electrolytic manganese and copper. The castings had a diameter of 20 mm and a height of 60 mm. After threefold deformation (shrinkage 50%) and twofold pressing (degree of compression about 60%), rods with a diameter of 6.5 mm were obtained. Between the deformations, homogenizing annealing at 500°C for 24 hours was performed. Final annealing at temperatures of 530, 500, and 400°C was carried out for 128, 200, and 600 hours, respectively. The content

Card 1/2 UDC: 669.715'3'74'73

L 42292-66

ACC NR: AP6019774

of copper, manganese, and cadmium in the alloys was controlled by chemical analysis. A series of graphs shows the determined phase compositions of the alloys with a constant manganese content of 1.5% and a constant cadmium content of 0.2%. The chemical composition and the hardness of the alloys investigated are listed in a table. A further figure shows the effect of natural aging and of aging at 165 and 200°C on the hardness and the electric resistance of various alloys. A final figure illustrates the influence of manganese and cadmium and of the aging temperature on the time required for attaining peak hardness in alloys containing 4% copper. Orig. art. has: 3 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 03Dec64/ ORIG REF: 005/ OTH REF: 003

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L 42134-66 EWT(m)/T/EWP(t)/ETI IJP(c) JH/JD/HW/JG

ACC NR: AP6027743 SOURCE CODE: UR/0370/66/000/004/0075/0083

AUTHOR: Drits, M. Ye. (Moscow); Fel'gina, S. B. (Moscow)

ORG: none

TITLE: Effect of alloying elements on recrystallization of magnesium-base alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 4, 1966, 75-83

TOPIC TAGS: alloy, manganese alloy, neodymium alloy, aluminum alloy, cerium containing alloy, nickel containing alloy, zinc containing alloy, magnesium alloy, recrystallization/MA11 alloy, MA8 alloy, BM17 alloy

ABSTRACT: The effect of additional alloying with Ce, Al, Mn, Ni or Zn on the recrystallization temperature of Mg-Mn, Mg-Nd, and Mg-Al alloys has been investigated. Mg-1.5% Mn alloy was additionally alloyed with 0.2—3.0% Ce or 0.1—2.0% Al; Mg-3.0% Nd alloy, with 0.2—1.5% Mn or 0.1—1.0% Ni; and Mg-4.5% Al alloy, with 0.2—1.5% Zn or Mn. Alloy specimens annealed to a coarse-grain structure were upset at room temperature with 60% reduction, annealed at 100 to 450C for 1 hr, and air cooled. Obtained data showed that in Mg-Mn alloy, 0.43% Ce raised the temperature of the beginning of recrystallization (t_{br}) from 150 to 300C, while 0.15—1.0% Al raised it only to 175C; at higher content of either element, the t_{br} dropped. Alloying of Mg-Nd alloy with 0.5% Mn raised the t_{br} from 325 to 375C, but at 1.5% Mn, the t_{br} dropped to 350C; 0.2% Ni had no effect, but 1.0% Ni lowered the t_{br} to 300C. Alloying

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L 42134-65

ACC NR: AP6027743

of Mg-Al alloy with 0.5% Mn or 1.5% Zn had no effect; 1.5% Mn or 0.5% Zn lowered the t_{br} from 175 to 150C. Mg-Nd-Mn and Mg-Nd-Ni alloys have the highest temperature of the beginning of recrystallization (300—375C) and the highest ratio of recrystallization temperature to melting temperature. Heat-resistant MA11 alloys, which can operate at temperatures of 250—300C, belong to this group. MA8 and BM17 alloys of the Mg-Mn-Ce system are less heat resistant and are capable of operating at 200—250C. Alloys of the Mg-Al-Mn and Mg-Al-Zn systems have low heat resistance and can be used for operation at 150—200C. Orig. art. has: 4 figures and 1 table. [AZ]

SUB CODE: 11/ SUBM DATE: 14Apr65/ ORIG REF: 021/ OTH REF: 002/ ATD PRESS: 5062

Card 2/2 MLP

L 46967-66 EWP(k)/EWT(d)/EWT(m)/T/EWP(w)/EWP(v)/EWP(t)/ETI IJP(c) EW/JD/HM

ACC NR: AT6024925 (A,N) SOURCE CODE: UR/2981/66/000/004/0159/0169

AUTHOR: Drits, M. Ye.; Kadaner, E. S.; Vashchenko, A. A.; Shiryayeva, N. V.; Fridlyander, I. N.

37
36
B+1

ORG: none

16

TITLE: Structure of weld joints of V96-type alloys

SOURCE: Alyuminiyevyye splavy, no. 4, 1966. Zharoprochnyye i vysokoprochnyye splavy (Heat resistant and high-strength alloys), 159-169

TOPIC TAGS: aluminum zinc alloy, aluminum alloy property, weld evaluation / V96 aluminum zinc alloy

ABSTRACT: The purpose of the study was to determine the influence of various alloying elements on the structure of V96-type weld joints by using filler wire of various compositions. A definite relationship was found between the tendency of the alloys to form hot cracks during welding and the structure of the transition zone of the weld joint. As a rule, the structure of the transition zone differs from the center of the seam in that it has coarser agglomerates of second excess phases along the grain boundaries; in most cases, these phases form a continuous network. The coarser the structure of the transition zone, greater its extent, more pronounced the network character of the structure, and greater the enrichment of the boundaries with brittle second phases, the more distinct is the tendency of the alloys to form hot cracks dur-

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ing welding. Conversely, a fine, regular structure of the transition metal zone and a discontinuity of the network of second phases correspond to lower values of the cracking coefficient. By selecting optimum welding conditions, one can influence the process so as to obtain a favorable structure in the transition zone and thus reduce the danger of failure of the weld joints. Orig. art. has: 7 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 003/ OTH REF: 001

Card 2/2

L 46768-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/GW/JG/JH

ACC NR: AP6031721 (A) SOURCE CODE: UR/0370/66/000/005/0125/0131

AUTHOR: Drits, M. Ye. (Moscow); Sviderskaya, Z. A. (Moscow); Yelkin, F. M. (Moscow)

ORG: none

TITLE: Effect of additional alloying on the structure and properties of beta-phase magnesium-lithium alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 5, 1966, 125-131

TOPIC TAGS: magnesium lithium alloy, aluminum containing alloy, zinc containing alloy, copper containing alloy, rare metal containing alloy, silver containing alloy, alloy structure, alloy property, MAGNESIUM BASE ALLOY, LITHIUM CONTAINING ALLOY, SOLID MECHANICAL PROPERTY

ABSTRACT: The effect of lithium and some other alloying elements on the structure and properties of magnesium-base alloys has been investigated. It was found that the mechanical properties of binary magnesium-lithium alloy remain unchanged with lithium content varied within 10—20%. The hot extruded alloys have high ductility, 40—50% elongation, but a tensile strength of only 9—11 kg/mm^2 and a yield strength of 6—7 kg/mm^2. In the as-cast condition, the alloy has a uniform coarse-grained structure of solid solution with grain size decreasing as lithium content increases from 10% to 20%. Aluminum added in the amount of 1.5% to magnesium-14% lithium alloy raises the tensile strength to 22—23 kg/mm^2, the yield strength to 20—22 kg/mm^2, and the hardness to 60—70 kg/mm^2, but reduces elongation to 10—15%; zinc, silver, copper

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ACC NR: AP6031721

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cadmium, and neodymium also increase the tensile and yield strength, but not as much as aluminum. Zinc, for instance, added in the amount of 0.25—4.0%, increases the alloy strength by 5—6 kg/mm^2, but reduces the elongation from 40—50% to 30—35%. Addition of 0.5—5.0% silver increases the alloy strength, but somewhat lowers its ductility. The alloy containing 14% lithium and 5% silver had a tensile strength, yield strength and elongation of 14 kg/mm^2, 10.7 kg/mm^2, and 38%, respectively. Alloying with neodymium, lanthanum and cerium increased the elongation to 60% without significant effect on the strength. Aging at 20C for 6 months or at 60C for 100 hr lowers the strength and raises the ductility of alloy containing aluminum. Alloys with an aluminum content of 0.75—2.0% are the least affected by aging. Zinc, silver, copper, neodymium, lanthanum, zirconium and yttrium reduce somewhat the softening effect of aging. Orig. art. has: 5 figures. [ND]

SUB CODE: 11/ SUBM DATE: 19Apr65/ ORIG REF: 004/ OTH REF: 018/ ATD PRESS: 5090

Card 2/2 mt

34778-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/HW/JG

ACC NR: AP6020714 SOURCE CODE: UR/0136/66/000/006/0083/0085

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Yelkin, F. M.

ORG: none

TITLE: Effect of alloying on the structure and properties of Mg-Li alloys containing aluminum

SOURCE: Tsvetnyye metally, no. 6, 1966, 83-85

TOPIC TAGS: magnesium alloy, lithium containing alloy, aluminum containing alloy, tin containing alloy, silver containing alloy, copper containing alloy, nickel containing alloy, calcium containing alloy, barium containing alloy, bismuth containing alloy, neodymium containing alloy, alloy property

ABSTRACT: An attempt has been made to improve and stabilize the mechanical properties of Mg—14% Li—1.5% Al alloy by additional alloying with Ca, Bi, Ba, Ni, Nd, Ce, La, Cu, Sn and Ag. Roughly machined alloy ingots were extruded at 200C with a reduction of 88% and tested for structure and mechanical properties. The test results showed that the structure of cast Mg—14% Li—1.5% Al alloy had a coarse-grained β-phase, which partly recrystallized with extrusion. The majority of quaternary alloys in the as-cast condition had a finer structure than the ternary alloys, while extruded alloys had a partly recrystallized structure with precipitation of a secondary phase.

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L 34778-66

ACC NR: AP6020742

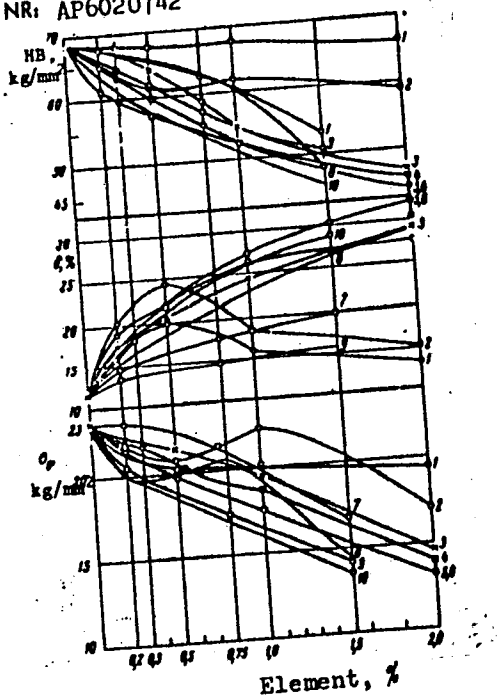

Fig. 1. Dependence of the mechanical properties of hot-extruded Mg—14%Li—1.5%Al alloy on the content of alloying elements

1 - Ag; 2 - Sn; 3 - Nd; 4 - Cu; 5 - La; 6 - Ce; 7 - Ba; 8 - Bi; 9 - Ca; 10 - Ni.

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ACC NR: AP6020742

With increasing content of Ca, Bi, Ba, Ni, Nd, Ce, La, Cu (from 0.10—0.30 to 1.5—2.0%), the tensile strength of the ternary alloys decreased by 7—9 kg/mm^2 and the ductility increased by 2—3 times (see Fig. 1). Alloying Mg—14%Li—1.5% Al with silver decreased the strength of the alloy considerably less than the other elements and had practically no effect on the structure. Mechanical tests of extruded alloys after stabilization annealing showed that none of the alloying elements, except silver, improves the stability of the mechanical properties. After stabilizing annealing (100 hr at 60C) the Mg—14%Li—1.5%Al—2%Ag alloy had a tensile strength of 17 kg/mm^2, a yield strength of 15.8 kg/mm^2, and an elongation of 24%, compared to 15.5 kg/mm^2, 14.8 kg/mm^2 and 20%, respectively, for Mg—14%Li—1.5%Al alloy, and showed at 60C a 15—20% increase in the short-and long-term hardness. Orig. art. has: 3 figures. [WW]

SUB CODE: 11/ SUBM DATE: none/ OTH REF: 005/ ATD PRESS: 5029

Card 3/3

L 07365-67 EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JD/JG/JH
ACC NR: AP6033619 SOURCE CODE: UR/0136/66/000/010/0077/0081

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Trokhova, V. F.

33
30
B

ORG: none

TITLE: Effect of chemical composition on properties of Mg-Li alloys

SOURCE: Tsvetnyye metally, no. 10, 1966, 77-81

TOPIC TAGS: magnesium lithium alloy, alloy composition, ~~alloy~~ metal property, alloy structure

ABSTRACT: The properties of binary magnesium-base alloys containing 0—12% lithium, melted from 99.91%-pure magnesium and 99.96%-pure lithium (to eliminate the effect of sodium), were determined in the hot-extruded or annealed (at 500C for 50 hr) conditions. It was found that lithium content increased the resistivity up to 12%: from 4.6 to 14.4 μ·ohm·cm for both hot-extruded and annealed specimens. With lithium content increased to 5%, microhardness increased from about 50 to 58 kg/mm^2 but dropped by 6—8 kg/mm^2 with further increase of lithium content. The density of alloys decreased with increasing lithium content from 1.74 g/cm^3 for pure magnesium to 1.39 g/cm^3 for alloy with 12% lithium. The tensile strength of hot-extruded alloy with 12% lithium (β-phase) dropped more than 50% and the elongation increased 8 times compared to those of pure magnesium. Annealing lowered the tensile strength of pure magnesium from 21 to 10 kg/mm^2; annealed alloys containing up to 10% lithium

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L 07365-67
ACC NR: AP6033619

have a tensile strength 2—7 kg/mm^2 higher than pure magnesium. The elongation of annealed alloys with 1—5% or over 10% lithium is lower than that of hot-extruded alloys. In two-phase alloys (5—10% Li), no difference is observed. The yield strength of hot-extruded or annealed alloys follows the same pattern as the tensile strength. Hot-extruded magnesium has a fine-grained structure; alloys containing over 10% lithium have a coarse-grained structure. Lithium has little or no effect on the recrystallization process. The β-phase appears in hot-extruded alloys at 3% lithium and is present in considerable amounts in alloys with 5% lithium. The structure of alloy with 6—9% lithium consists of α and α + β eutectic. Alloys containing over 10% lithium have a homogeneous structure of β-solid solution. The alloys containing more than 3% lithium have a tendency to soften under stresses at temperatures as low as 60—100C. The rupture strength of alloys with 9—12% lithium is 80% lower than that of pure magnesium. Only in alloy containing 2% magnesium is the rupture life higher than in pure magnesium. Orig. art. has: 2 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 002/ ATD PRESS: 5101

Card 2/2 afs

L 05128-67 EWT(m)/EWP(t)/ETI IJP(c) JD/HW/JG

ACC NR: AP6027738 SOURCE CODE: UR/0020/66/169/004/0884/0886

AUTHOR: Drits, M. Ye.; Bochvar, N. R.

35
B

ORG: Metallurgy Institute im. A. A. Baykov (Institut metallurgii)

TITLE: Determination of the limits of joint solubility of neodymium and nickel in solid magnesium

SOURCE: AN SSSR. Doklady, v. 169, no. 4, 1966, 884-886

TOPIC TAGS: neodymium, nickel, magnesium, solubility, alloy phase diagram

ABSTRACT: In order to determine the limits of joint solubility of neodymium and nickel in solid magnesium, isothermal sections of the Mg-Nd-Ni diagram were plotted at 430, 400 and 250° on the basis of microscopic and chemical analyses of the alloys and measurements of their electrical resistance. All the sections intersect six phase regions: a single-phase region of a solid solution of Nd and Ni in Mg, three two-phase regions $\alpha+Mg_9Nd$, $\alpha+X$ and $\alpha+Mg_2Ni$, and two three-phase regions $\alpha+Mg_9Nd+X$ and $\alpha+X+Mg_2Ni$. It was found that the introduction of Ni into Mg-Nd alloys decreases the solubility of Nd in Mg, whereas the introduction of Nd into Mg-Ni alloys leaves the solubility of Ni in Mg virtually unchanged. As the temperature drops, the relative positions of the phase regions change: the single- and two-phase regions narrow down, and the three-phase regions widen. From the microstructural studies, the separate and joint solubilities of Nd and Ni in solid magnesium were determined at 430, 400, and

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ACC NR: AP6027738

250°C. The electrical resistance measurements confirmed the microstructural data. The paper was presented by Academician Sazhin, N. P., 13 Dec 65. Orig. art. has: 2 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 10Dec65/ ORIG REF: 004/ OTH REF: 001

Card 2/2

ACC NR: AP6036443 SOURCE CODE: UR/0370/66/000/006/0114/0120

AUTHORS: Drits, M. Ye. (Moscow); Sviderskaya, Z. A. (Moscow); Rokhlin, L. L. (Moscow)

ORG: none

TITLE: Effect of alloying and of thermal treatment on the extinction of ultrasonic vibrations in magnesium alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 6, 1966, 114-120

TOPIC TAGS: magnesium alloy, calcium ~~containing~~ alloy, rare earth, ~~containing alloy~~, ultrasonic vibration, ultrasound absorption

ABSTRACT: The effect of adding calcium and mischmetal (98% rare earth metals containing 46% Ce), respectively, to magnesium on the scattering and extinction of supersonic waves in the alloy was determined. In addition, the effect of different thermal treatments of the alloy on the extinction of supersonic vibrations was investigated. The study supplements the results of D. P. Lovtsov, V. P. Sizov, and A. G. Spasskiy (Vliyaniye usloviy lit'ya na zatukhaniye ul'trazvuka v metallakh. Izv. VUZov, Tsvetnaya metallurgiya, 1958, No. 3, 127). The alloy specimens were prepared after the method of Lavrov. A schematic of the experimental installation for the determination of ultrasonic absorption is presented. The microstructure, hardness, and electrical resistance of the specimens were correlated with the ultrasonic absorption of the latter, and the experimental results are presented graphically (see Fig. 1).

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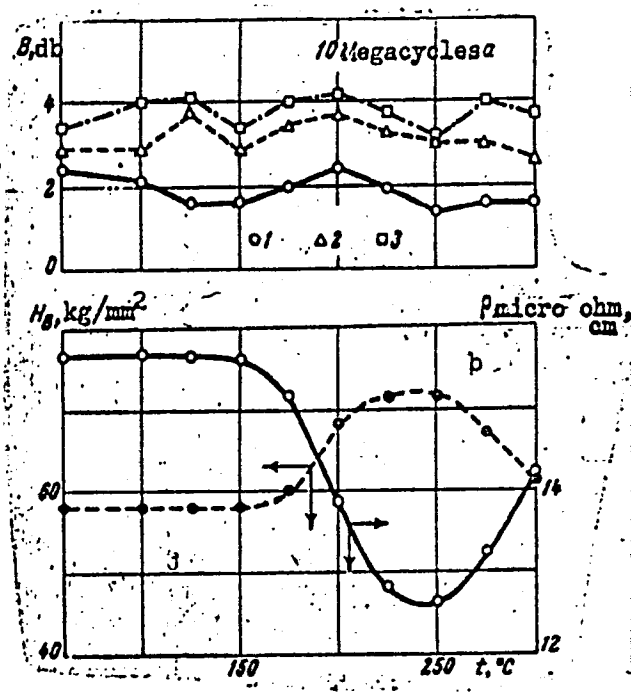
Fig. 1. Dependence of the extinction of ultrasound (a), hardness and specific electrical resistance (b), respectively, of alloy Mg + 8% Al on the aging temperature (initial state—after quenching); length of specimen during ultrasonic extinction measurements: 1 - 50, 2 - 85, 3 - 125 mm



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ACC NR: AP6036443

It is concluded that the extinction of ultrasonic vibration in these alloys is a function of the grain size of the latter (the extinction is smaller—the smaller the grain size). The formation of small amounts of fine-grained intermetallic compounds has no noticeable effect on the extinction of ultrasonic vibrations. Orig. art. has: 6 tables and 2 equations.

SUB CODE: 11/ SUBM DATE: 18Feb65/ ORIG REF: 005/ OTH REF: 003

Card 3/3

ACC NR: AP7004[illegible] (N) SOURCE CODE: UR/0369/66/002/006/0621/0623

AUTHOR: Drits, M. Ye.; Kadaner, E. S.; Romanov, V. V.

ORG: Institute of Metallurgy im. A. A. Baykov AN SSSR, Moscow (Institut metallurgii AN SSSR)

TITLE: Effect of copper and chromium on the corrosion properties of Al-Zn-Mg alloys

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 6, 1966, 621-623

TOPIC TAGS: aluminum ~~zinc magnesium~~ base alloy, magnesese containing alloy, zirconium containing alloy, copper containing alloy, chromium containing alloy, ~~alloy~~ corrosion resistance, ~~alloy~~ mechanical property, stress corrosion, corrosion rate, corrosion resistant alloy

ABSTRACT: Ingots of Al-Zn-Mg aluminum alloys containing (%) 5 Zn, 2.5 Mg, 0.2—0.5 Mn, 0.15 Zr, additionally alloyed with up to 0.75% Cu and/or 0.16% Cr were hot and cold rolled into 2.5 mm-thick sheets. The sheets were solution annealed at 450C, quenched, naturally aged for 7 days or artificially aged at 100C for 10 hr or at 140C for 24 hr, and then tested for mechanical properties and corrosion resistance. Corrosion tests were done in a solution of 30 g/l of NaCl + 20 g/l of $NaHCO_3$. The general corrosion rate was investigated on specimens fully submerged for 200 hr. The stress corrosion was investigated on specimens under a tensile stress equal to 90% of the yield strength for 500 hr. The stressed alloys, without Cu or Cr additions, aged at 100 and 140C

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ACC NR: AP7004179

failed after 45—68 and 66—124 hr, respectively. Addition of 0.03% Cu increased the life of the specimens of the alloys aged at 140C to 91—131 hr but had a negligible effect on alloys aged at 100C. Chromium additions increased the stress corrosion of the alloys more than copper additions, expecially of the alloys aged at 100C. Chromium also lowered the corrosion rate, while copper accelerated it in unstressed specimens. In combined alloying with Cr and Cu, additions of 0.3% Cu to alloys with a constant Cr content increased the life of the alloy specimens to more than 500 hr. An alloy containing 0.5% Cu aged at 100C for 100 hr had the highest stress corrosion resistance (more than 550 hr). The stress corrosion of all other alloys increased with aging at 140C. Copper additions increased the stress corrosion resistance of Al-Zn-Mg alloys with chromium substantially more than that of alloys without chromium. For example, 0.3% copper addition had practically no effect on the life of Al-5% Zn-2.5% Mg-0.5% Mn-0.15% Zr, while the same addition of copper to the alloy with 0.16% Cr increased its life by several times, even at a lower (0.2%) manganese content. Combined alloying with Cu and Cr increased the tensile strength of the initial alloy from 48.5 to 51.7 kg/mm^2, the yield strength from 38.5 to 40.5 kg/mm^2, and the elongation from 13.1 to 31.7%. Orig. art. has: 2 tables. [MS]

SUB CODE: 11/ SUBM DATE: 08Jun66/ ORIG REF: 001/ OTH REF: 001/ ATD PRESS: 5115

Card 2/2

AT6034461 (A) SOURCE CODE: UR/0000/66/000/000/0237/0244

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Rokhlin, L. L.

ORG: none

TITLE: Improvement of the properties of heat resistant magnesium alloys

SOURCE: AN SSSR. Institut metallurgii. Svoystva i primeneniye zharoprochnykh splavov (Properties and application of heat resistant alloys). Moscow, Izd-vo Nauka, 1966, 237-244

TOPIC TAGS: magnesium containing alloys, neodymium containing alloy, mechanical heat treatment

ABSTRACT: A significant improvement in the strength of heat resistant magnesium alloys containing neodymium has been achieved by the use of low temperature thermomechanical working, followed by hardening, cold plastic deformation, and subsequent artificial aging. This has permitted a considerable improvement in the mechanical properties of alloys of the systems Mg-Nd, Mg-Nd-Mn, and Mg-Nd-Mn-Ni. The mechanical properties were determined on samples prepared from hot pressed rods. Hardening was done at a temperature of 535°C, with a holding time of 4 hours. Cold deformation was done by elongation on a IM-4R machine, which was also used for determining the mechanical properties. Artificial aging was done for 24 hours at a

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temperature of 175°. A table shows the mechanical properties of a magnesium alloy with 3% Nd at different temperatures. Further tables and figures show the experimental data on the effect of the degree of deformation and the effect of high temperature thermomechanical working on the mechanical properties at different temperatures. Microphotos show the microstructure of alloys of magnesium with neodymium. Orig. art. has: 4 figures and 2 tables.

SUB CODE: 11/ SUBM DATE: 10Jun66/ ORIG REF: 021/ OTH REF: 004

Card 2/2

DRITS, V.

Benefits derived from the centralization of accounting in public institutions. Fin. SSSR 23 no.8:58-60 Ag '62. (MIRA 15:8)
(White Russia--Public institutions--Accounting)

DRITS, V.; UZHVENKO, M.

Change the procedure of income tax payment by consumer cooperatives. Fin.SSSR 37 no.3:59-62 Mr '63. (MIRA 16:4)

1. Starshiy ekonomist Labinskogo rayonnogo finansovogo otdela Krasnodarskogo kraya.
(White Russia—Cooperative societies—Taxation)

DRITS, V.A.

Method for quantitative phase X-ray structure analysis. Zav. lab. 24 no.5:565-569 '58. (MIRA 11:6)

1. Irkutskiy gosudarstvennyy universitet.
(Phase rule and equilibrium)

DRITS, V.A.; KASHAYEV, A.A.

X-ray study of a kaolinite single crystal. Kristallografiia 5 no.2:224-227 Mr-Ap '60. (MIRA 13:9)

1. Irkutskiy gosudarstvennyy universitet i Irkutskoye geologoupravleniye.
(Kaolinite)

DRITS, V. A., Cand. Phys-Math. Sci. (diss) "X-Ray Study of Clay Minerals." Moscow, 1961, 14 pp (Institute of Crystallography, Acad of Sci. USSR) 150 copies (KL Supp 12-61, 250).

NIKULINA, S.Ya.; DRITS, V.A.

Catalytic properties of some clays of the Irkutsk Province.
Report No.4: Acid activation of clays of Troshkovskiy deposits.
Izv. Fiz.-khim. nauch.-issl. inst. Irk. un. 5 no.1:161-170 '61.
(MIRA 16:8)

(Irkutsk Province—Clay) (Catalysis)

BELYAYEVA, V.A.; DRITS, V.A.; ZAKHVALINSKIY, M.N.; LARINA, V.A.; NAGORNAYA, Ye.F.; NIKULINA, S.Ye.; NAGORNYY, G.I.; SEMIUSOVA, T.N.

Characteristics of clays of the Troshkovskiy deposits of the Irkutsk Province. Izv. Fiz.-khim. nauch.-issl. inst. Irk. un. 5 no.1:252-289 '61. (MIRA 16:8)

(Irkutsk Province—Clay—Analysis)

DRITS, V.A.; KASHAYEV, A.A.

X-ray diffraction study of some composite laminated structures.
Kristallografiia 6 no.2:190-195 Mr-Ap '61. (MIRA 14:9)

1. Irkutskiy gosudarstvennyy universitet im. A.A.Zhdanova.
(X rays--Diffraction) (Crystal lattices)